Remarks

This Preliminary Amendment adds no prohibited new matter and comprises information contained in prior amendment to the International Application made under PCT Article 14, which amendments are considered part of the original application and were transmitted to the Receiving Office by the International Bureau. For purposes of convenience, Applicant has transmitted herewith, copies of the Amended Sheets made under PCT Article 14. Entry of the Preliminary Amendment is respectfully requested.

Respectfully submitted,

Robert P. Simpson, Esq.
Registration No. 33,034
Attorney for Applicant
Simpson & Simpson, PLLC
5555 Main Street
Williamsville, NY 14221
Telephone: (716) 626-1564
Facsimile: (716) 626-0366

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MARKED UP VERSION TO SHOW CHANGES MADE

[Method for Recording, Reproducing or Projecting Digital or Analogue, Sampled or Connected Audio and/or Video Records

Field of the Invention

The invention relates to recording, reproducing, or projecting digital or analogue, sampled or connected audio and/or video recordings and is characterised by the unique matching of sound with image recordings or of at least two sound or two image records respectively. The invention can be utilised in filmmaking, security, commercial, professional and closed circuit television technology and, primarily, in video technology. Thus, the invention generally relates to recording and reproduction or projection audio and video technology.

Prior Art

At present, analogue VCRs are used on a limited scale in special security or monitoring systems to record image and sound information on continual medium. This automatically matches an image sample with the respective sound sample.

Sampled recording by analogue VCRs only records image information. Recording sound associated with sampled images remains unresolved. Therefore, sound is either not recorded at all or is recorded separately and as such does not lend itself to synchronisation with respective image recordings. Digital VCRs are successfully used in professional filmmaking technology as well as in security and other control systems. Digital VCRs record image information only in the

connected continuous recording mode together with sound. Sound and image information is typically recorded on the same recording medium such as HDD (hard disk). Image and sound are synchronised, which is mostly related to the start of recording. However, in the sampling recording mode digital video recorders do not enable to match continuously recorded sound to respective images.

Lastly, in conventional filmmaking technology image and sound are only acoustically synchronised at the beginning using slapstick.

As no method is currently available for applying sound to a separate image recording and as some recording systems are yet to resolve synchronisation of sound and image or of at least two image and two sound recordings respectively, the need has arisen to deal with the problem, ultimately leading to the present invention.

Substance of the Invention

The method for recording, reproducing or projecting digital or analogue, sampled or connected audio and/or video recordings in accordance with the invention to large extent eliminates the above deficiencies. The substance of the invention is in synchronising at least one audio and one video recording or an audio and audio recording or a video and video recording by means of the real time of recording where, in respect of at least one sample, the real time of recording serves as the synchronising element for reproduction or projection.

The possibilities offered by the above method are further enhanced by the fact that synchronised audio and/or video recordings are locally independent. This means that in a closed or open local system it is possible, within a selected real time interval of a sound recording, to match corresponding image samples from any other closed or open local interior or exterior system.

Another significant feature of an alternative embodiment of the method in accordance with the invention is the option of functional independence of synchronised audio and video recordings. This feature can primarily be utilised when the duration of playback or projection of a sound and image recording differ, including a playback or projection failure.

Lastly, another significant feature of the method in accordance with the invention is the assignment of an identification code to dependent or independent matched audio and video recordings.

The benefits of the method for the playback or projection of digital or analogue sampled or connected audio and/or video recordings consist in the unique matching of image samples and selected sound samples or of at least two image or sound samples respectively. Real time is the

moment of a given recording, which is unique and uniquely associated with a given moment and recorded as such during the recording of the audio and video signal. The notion of 'real time' implies a moment of time complete with information about the year, month, hour, minute, second and fractions thereof. Real time is not an information value but a control element (a signal). The method in accordance with the invention solves in a fairly simple fashion the problem of image and sound synchronisation by controlling playback and projection by means of real time rather than by the start of the recording as in conventional systems. For the purposes of this invention: The notion of 'recording as an activity implies the recording (REC) of image and sound to any recording medium such as magnetic tape and disk, optical disk, hard disk, film tape or a semiconductor chip or other recording media; the notion of 'recording' as an object implies the outcome of recording, i.e. the recording medium already storing image and/or sound information; the notion of 'reproduction' as an activity implies the playing back of recorded image or sound information after it was recorded or the subsequent processing of such information. In sound technology, for example, this relates to the playback of a recorded acoustic signal using reproduction equipment. The same applies to image technology (with the exception of conventional film technology). With regard to conventional film technology, where the recording medium for image and sound information is represented by conventional film tape, with film tape recording image and a separate magnetic tape recording sound, the relevant notion is called 'projection' and is used for the playback of image

signals using specialised reproduction equipment (a film projector). The benefit of the method in accordance with the invention is its simple implementation in digital systems by means of software. In analogue video and television systems, the method can be implemented either entirely or in part by software as well as hardware. In conventional filmmaking technology, the method can only be implemented by means of hardware that inserts time markings in between images, for example, in the form of bar codes, or by using part of the track to record a time value. The method can be beneficially used in sampled recordings, particularly in security systems; however, it can certainly be applied to connected audio and video recordings. Another major advantage consists in easy sound and image synchronisation when a part of data from either the audio or video recording is missing or lost, enabling to continue viewing images. If, for example, the capacity of a recording medium such as one used to record sound is exhausted and the operator does not insert another medium until after a delay, the proposed solution will not require a special start but images will be launched during playback (reproduction) when the sound time mark matches the time mark of the respective image etc. Under the proposed method, images from another recording with a different real time feature will not be launched during playback, as the respective day and time are unique and non-recurrent. The only condition is the matching of the system (real) time of the audio and video systems during recording. As image and sound synchronisation is secured by real time, a selected audio signal can be associated with one or several video recordings, even those that are locally independent. The advantage of the method consists in its versatility as it can be primarily applied in video systems that separately record sound and image. The method, however, can also be used in filmmaking technology (i.e. applied to conventional film) and television technology. An advantage useful in special applications, for example in systems comprising several cameras and several microphones, is the assignment of an

identification code to audio and video channel recordings (signals) where an audio recording is matched to the respective pair of video recordings so as to make the playback of several recordings transparent and unequivocal. The method also enables intermittent image recording while sound is recorded continuously. It is maintained that the method in accordance with the invention enables to synchronise an unlimited number of audio and video recordings, including those made at different locations commencing at a different moment in time that is associated with a particular event, i.e. the launching of the recording is not time-dependent and is synchronised during playback as the real time of the recordings match. The recording of any event can be interrupted (for example during scenes not deemed to deserve recording) and restarted later. During playback, the recording will be started again in a synchronised mode as the recorded real time markings are matched.

The method in accordance with the invention can also be used as a monitoring system in government and private businesses.

Embodiments of the Invention

Embodiment 1

This example describes the recording and playback of a single digital sampled audio and video recording by a digital video recorder with a single CCD camera, microphone and monitor. This mode is particularly useful for security or control systems. Image records are sampled at a rate of one image a minute, with the image record capturing real time information. Sound is recorded in a connected continuous fashion, also capturing real time information. To reproduce image and sound, i.e. to play back the recording, e.g. in order to examine it, the real time of the audio recording selected by the operator serves as the synchronisation signal. Supposing the operator chooses the real time interval from 1999-07-10 18:32:24 to 1999-07-10 18:50:00, then for a selected real time moment during the playback of the required connected sound recording the monitor will gradually display a sequence of 18 images of the monitored space from the selected time interval and associated with replayed sound.

Embodiment 2

This example describes another mode of recording and playback of a sampled audio and video recording made using a digital recording system with a single CCD or CMOS camera featuring a motion detection function and a microphone. This mode is particularly appropriate in security and surveillance systems. Sound is recorded in a connected (continuous) fashion, as it does not require excessive recording medium capacity. Image is sampled every tenth second or continuously on detecting motion. In this instance, the real time of the audio recording serves as

the synchronisation element during playback. In other words, while replaying a time interval, the operator listens to sounds in the surveyed area (such as a conversation between two and more people who remain static). On making a motion, the persons automatically activate the motion detection function and the system continuously records the image, enabling the operator to view an image (moving persons) while continuing to monitor sounds. After the persons become static, the system reverts to sampling at a rate of one image every ten seconds, while the sound continues to be recorded uninterrupted.

Embodiment 3

This example is derived from Embodiment 2, however, the motion detection function can be replaced by the system operator switching on continuous recording, image being sampled every two seconds and sound recorded in a connected fashion. For example, if a security officer responsible for a secured area views on screen and listens to what goes on in the secured area, the officer has the option of activating continuous image recording to capture in detail the action in a given time interval. During playback, sound is reproduced continuously and image is sampled. Starting at the moment when the officer activated continuous image recording, image is also displayed continuously after which it is sampled again. Sound invariably remains continuous. The advantage is that images, be it sampled or continuously recorded, are synchronised with sound during playback, as an image/images is/are displayed at the moments when recorded real time of image matches the recorded real time of sound.

Embodiment 4

This example describes an alternative way of recording and playing back several digital locally dependent connected audio and video recordings. In particular, this mode can be used in the film industry, during filmmaking and to create film effects. For example, a unique non-recurring scene is being filmed by four cameras from four angles, recording image and sound and capturing real time. During editing at a later stage, the real time of audio and/or video recordings serves as the synchronising element, enabling the selection of image and its association with, for example, non-matching sound with identical real time, for example when an image is selected with a different angle of image or sound recording.

Embodiment 5

This example describes an alternative way of recording and playing back several locally independent digital audio and video recordings. This version is derived from Embodiment 1. Here, the security system has been enhanced, for example by a set of 10 cameras. Sound is recorded by an independent system with six armed microphones built into the monitored nodes of the secured facility. Thus, theses systems and their audio and video recordings are functionally

independent. Monitoring or examining audio and video recordings enables to survey, by choosing the respective real time of recording, the secured nodes of the facility. A local sound signal with a selected real time can be associated with an image or several images with the same real time but recorded at different locations; it is possible to switch between these images, as all recordings can be played back in a synchronised fashion synchronised using their real time.

Embodiment 6

This example describes a way of recording and playing back several independent sampled analogue audio and video recordings in closed circuit television systems. In substance, the method is derived from one in Embodiment 5 and adjusted to suit the needs of closed circuit television transmission. Furthermore, the method enables to match audio and video recordings designated using identification codes. The apparent benefit is that the method in accordance with the invention can be implemented in existing closed circuit television networks by means of simple software or hardware modifications.

Embodiment 7

This example describes a way of recording and projecting analogous connected audio and video recordings in conventional filmmaking technology, where image and sound are optically recorded on conventional film tape. Here, the method in accordance with the invention can be applied, for example by recording, such as by means of bar code or other means, real time information onto film tape in between images or onto the marginal segments of the recording medium, enabling unique matching of image and sound (if recorded separately) or of several image signals.

Industrial Applications

The method of recording, playing back or projecting digital or analogue sampled or connected audio and/or video recordings in accordance with the present invention can be generally applied in every recording and reproduction audio and video system and projection technology.

[Abstract

Name of the invention: Method for Recording, Reproducing or Projecting Digital or Analogue, Sampled or Connected Audio and/or Video Records

The method is based on the fact that, in respect of audio and/or video signal recording, the synchronisation of at least one audio and/or video recording is carried out by means of real time. The real time of recording serves as the synchronising element of at least one image or sound sample during its reproduction or projection. Furthermore, audio and/or video recordings may be locally and functionally independent and may be assigned an identification code.]

METHOD FOR RECORDING, REPRODUCING OR PROJECTING DIGITAL OR ANALOG, SAMPLED OR CONTINUOUS AUDIO AND/OR VIDEO RECORDS

CROSS REFERENCE TO RELATED APPLICATIONS

[0001] This national stage patent application claims benefit of International Application No. PCT/SK00/00010, filed on June 23, 2000, which was published in English, which claims priority of Slovakia Republic Application No. PV 1119-99, filed August 17, 1999.

FIELD OF THE INVENTION

[0002] The present invention generally relates to recording and reproduction or projection of audio and video recordings. More specifically, the present invention relates to recording, reproducing, or projecting digital or analog sampled audio and/or video recordings, or continuous audio and/or video recordings, and is characterized by the unique matching of sound with image recordings, or the matching of at least two sound or two image records, respectively. The invention may be utilized in the filmmaking, security, commercial, professional and closed circuit television technology industries, primarily, in video and audio technology.

BACKGROUND OF THE INVENTION

[0003] At present, analog Video Cassette Recorders (VCR's) are used on a limited scale in special security or monitoring systems to record image and sound information on a continuous medium. This use typically automatically matches image samples with respective sound samples. However, sampled recording via analog VCR's only records image information and sound recordings associated with sampled video images are either not recorded at all, or are recorded separately such that synchronization with a respective image recording is improper.

[0004] Digital VCRs are also successfully used in professional filmmaking technology as well as in security and other control systems. Digital VCRs record image information only in the continuous recording mode together with sound. Sound and image information is typically recorded on the same recording medium. For instance, in a hard disk, image and sound recordings are synchronized, which is generally attributed to the time at which both sound and image recording is commenced. However, in the sample recording mode, digital VCR's are not capable of matching continuously recorded sound with respective images.

[0005] In conventional filmmaking technology, image and sound are only acoustically synchronized at the beginning using slapstick.

[0006] Consequently, because acceptable methods to match audio recordings with video recordings are not currently available, and because most recording systems cannot properly synchronize audio and video recordings, or synchronize at least two image and two sound recordings, respectively, there is a longfelt need to create a method for properly matching audio and video recordings.

[0007] The advantages of the present invention are generally provided by means of software. In analog video and television systems, the present invention can be implemented either entirely, or in part, by software, or by means of hardware. In conventional filmmaking technology, the method can only be implemented by means of hardware that inserts time markings in between images, for example, in the form of bar codes, or by using part of a track to record a time value. The method can also be used in sampled recordings, particularly in security systems, and can be applied to continuous audio and/or video recordings.

[0008] Another advantage of the method of the present invention is that it provides simple synchronization of sound and image recordings, when part of the sound or image data is missing or lost. For example, if the capacity of a recording medium, such as an audio tape, is exhausted and the operator does not insert another tape until after a time delay, any video images intended to correlate with the audio tape will not be reproduced until the audio data time mark matches that of the video image. In addition, images from a first recording having a different real time from another second recording may not be launched during reproduction, as the respective real times of the two recordings do not correlate with one another. Accordingly, since image and sound synchronization is based upon real time, audio and video signals can be associated with one, or several, audio and video recordings, even those that are locally independent. Hence, the advantages of the method of the present invention lay in its ability to be used in video systems that separately record sound and images. The method, however, can also be used in filmmaking technology and television technology. For example, in systems comprising several cameras and several microphones, the assignment of identification codes to audio and video channel recordings (signals) enables the matching of an audio recording to the respective video recording such that playback of the several recordings is transparent and unequivocal. The method also enables intermittent image recording while sound is recorded continuously. Furthermore, the method of the present invention enables one to synchronize an unlimited number of audio and video recordings, including those made at different locations and at different times, so long as the "Real Time" (RT) data element of one of the recordings matches that of another. The recording of any event can also be interrupted (for example during scenes

not deemed to deserve recordings) and later restarted and re-synchronized by means of the respective "Real Time" (RT) data elements.

[0009] The method in accordance with the present invention is, thus, eminently suited for use as a monitoring system in government and private businesses.

SUMMARY OF THE INVENTION

[0010] The present invention generally comprises a method for synchronizing digital or analog and sampled or continuous, audio and video recordings comprising the steps of inserting a real time data element into audio or video recordings during recording procedures, analyzing the real time data elements of the audio and video recordings during reproduction, comparing the real time data elements of the audio and video recordings and synchronously projecting the audio and video recordings as a function of the real time data elements, wherein the real time data elements of the present invention comprise an extension data portion for providing optional data and a real time data portion comprising information pertaining to location and time of recording.

[0011] An object of the present invention to provide a method for synchronizing at least one audio and one video recording, or an audio and audio recording, or a video and video recording by means of the real-time of the recording where, in respect to at least one sample, the real-time of recording is used to serve as the synchronizing element for reproduction or projection.

[0012] Another object of the present invention to provide a method for synchronizing audio and/or video recordings that are locally independent.

[0013] A final object of the present invention to provide a unique data element for synchronizing audio and video recordings.

[0014] These and other objects, features and advantages of the present invention will become apparent upon reading the following detailed description of the invention in view of the several drawing figures and appended claims.

BRIEF DESCRIPTON OF THE DRAWINGS

[0015] The invention will now be described in more detail with reference to the appended drawings in which:

Figure 1 depicts the contents of inserted "Real Time" (RT) data element of the present invention;

Figure 1a depicts an example of a display produced using the inserted "Real Time" (RT) data element of the present invention;

Figure 2 depicts an inserted "track" of the "Real Time" (RT) data elements of the present invention, in series, in association with an audio or video recording;

Figure 2a depicts an inserted RT data element "track" of the present invention in association with an audio or video recording having been stopped for a period of approximately five minutes;

Figure 3 depicts the output of "Real Time" (RT) data elements as they are passed through conventional and specially adapted audio recording or output devices;

[0016] Figure 4 depicts the use of the "Real Time" (RT) data elements of the present invention to synchronize audio and video recordings derived from separate sources;

[0017] Figure 5 depicts a preferred use of the present invention as a component of audio and/or video based systems for monitoring.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

[0018] In the detailed description that follows, identical reference numbers on different drawing views are intended to represent identical structural elements of the invention. As used herein, positional and functional independence is intended to infer that recordings do not need to be of the same type, do not need to be made on the same recording apparatus, nor made in the same locale. Accordingly, each recording can be made on different apparatus, which does not necessarily need to be mutually connected in any way during the recording process, may be produced at a different location, and may be produced upon a different type of recording media, without contemplating synchronized reproduction beforehand.

[0019] As used herein "real time" is intended to describe the moment of a given recording, which is unique and uniquely associated with a given moment in time and recorded as such during the recording of an audio and video signal. Thus, "real time" implies that moment in time as it relates to the year, month, hour, minute, second and fractions thereof. "Real Time (RT)" as used herein is intended to comprise a signal or control element also comprising information pertaining to a moment in time as it may relate to the year, month, hour, minute, second and fractions thereof. For the purposes of illustration, a "continuous recording" is intended to refer to those types of recording wherein data is continuously recorded without interruption; from the beginning until the end of recording. In addition, "sample" and "sampled" recording/recordings is intended to describe non-continuous and/or combined continuous and non-continuous types of recording wherein the recording is interrupted at some point during the recording process. As used herein, "recording", as it refers to an activity, is intended to describe recording of audio or video to any recording media, for example, magnetic tapes and disks,

optical disks, film tapes, semiconductor chips, and other types of recording media known in the art. As used herein, "recording", as it refers to a physical object, is intended to refer to the outcome of recording (e.g. the produced recording medium storing image and/or sound information). As used herein, "reproduction", as it refers to an activity, is intended to describe the play back of recorded audio and/or video information or the subsequent processing of such information. "Projection" is intended to refer to the audio or visual output of an audio or video recording that occurs through reproduction.

[0020] Adverting now to the Figures, as shown in Figure 1, the Real Time (hereinafter "RT") data element of the present invention can be coupled, by means generally known by those having ordinary skill in the art, with multiple types of recording media for purposes of synchronizing a variety of media recordings according their actual and local times of recording. Hence, synchronization is efficiently obtained due to the fact that a single moment in time exists only once. RT data element generally comprises an extension data portion, which has an optional data portion and a reserve portion, and a real time component. The optional data portion of the extension data component may include any text or numeral data as determined by an operator. The real time component of the RT data element generally comprises a country coded portion, a date portion, and hour, minutes, seconds, and milliseconds portions, which are based on the local, actual time adjusted for differences from Greenwich Mean Time. Hence the time of a recording cannot be adjusted by an operator, although the RT data element may be modified for orientation purposes. Thus, for example, Figure 1a illustrates RT data element as comprising optional data "DEPOT NR. 2", reserve component "X.....X", country code "421", which corresponds to the Slovak Republic, Date component "20000810", which corresponds to the date

of August 10, 2000, and time component "11231480", which corresponds to 11 hours, 23 minutes, and 14.80 seconds.

[0021] Referring now to Figure 2, as can be seen, RT data element of the present invention is capable of being associated with multiple types of recording media by methods currently available to those having ordinary skill in the art. For example, RT data element may be integrated into audio and/or video tapes, compact disks, memory chips, film tapes, and the like. In the case of Figure 2, RT data element is shown as track R and may be integrated with an audio or video track, herein referred to as track L. As is readily apparent, as the track is caused to record or playback, RT data element may be inserted or analyzed. As shown in Figure 2a, RT data element of the present invention can be inserted alongside an audio or video track during recording. Upon cessation of recording, RT data element is no longer inserted, however, upon resuming recording, RT data element is re-inserted according to the current date and time of the recording is resumed. As can be seen in Figure 2a, data corresponding to time 11 hours 23 minutes and 16.20 seconds was inserted during recording procedures; however, the recording procedure ceased for a period of approximately five minutes. Consequently, resuming recording is shown have caused RT data element to be inserted to comport with time 11 hours, 28 minutes and 16.40 seconds, five minutes later.

[0022] Referring now to Figure 3; RT data element of the present invention is capable of being processed and analyzed such that information pertaining to date and time may be displayed. However, specially adapted playback equipment is generally required. As can be seen, RT data of the present invention played back on conventional equipment will not affect the projected audio or video quality of the reproduced recording, nor display RT data element

information. However, a sound recording comprising the RT data element of the present invention, which is played back on specially adapted equipment, may display the RT data element information. In the case of Figure 3, country code 421, optional information DEPOT NR. 2, date 10.08.2000 and time 11:23:18.80 are shown as being projected on a display device.

[0023] Referring now to Figure 4; RT data element of the present invention can also be utilized to synchronize a plurality of recordings produced at the same time, recordings produced on different types of recording media, or for the synchronizing recordings where commencement of the production of the recordings was not concurrent. Most notable is the fact that RT data element of the present invention even provides for the synchronization of recordings that do not appear to comprise common subject matter. For example, Figure 4 illustrates the synchronization of multiple types of recordings that may, or may not, comprise common subject matter. As shown in Figure 4, the synchronization of an audio recording "DEPOT NR. 2", a first video recording "DEPOT NR. 2", comprising a sinister figure, and a second video recording, "ENTRY-YARD", comprising an individual pictured in a park-like setting, is provided. While the subject matter of the DEPOT NR. 2 audio and video recordings appear to be related to one another, (e.g. each pertains to audio and video recordings "DEPOT NR. 2"), the ENTRY-YARD recording does not appear to be related. Nonetheless, the ENTRY-YARD video recording is capable of being synchronized with the "DEPOT NR. 2" audio and video recordings via its common RT data element because all three recordings comprise common RT data element information corresponding to date 10.08.2000 and time 11:23:18.80. Typically, a multi-input comparator is used to analyze and compare RT data element information from each recording

and then issue start and/or stop commands to the appropriate reproduction device based upon the information contained in each RT data element.

[0024] Nevertheless, while synchronization of various types of recordings that do not appear to be related is possible with the present invention, preferred applications of the present invention comprise synchronization of audio and video recordings that are related. One such preferred application comprises security systems for monitoring areas or locales. As shown in Figure 5, a plurality of video cameras in association with one or more audio recording devices (not shown) can be placed in various locations throughout a building or area to be monitored. As the audio and video recording devices record their respective information, RT data elements are inserted accordingly. Consequently, the inserted RT data elements can be used to synchronize the various audio and video recordings upon playback such that one may correlate a sound with one or more video images, or vice-versa. More specifically, a video recording in office 1 may be synchronized with an audio recording from office 1, or a video recording from office 1 may be synchronized with an audio recording from office 2, and so on.

[0025] Another security system related example comprises the recording and playback of a single digital audio and video recordings by a digital video recorder with a single closed circuit digital camera (CCD), microphone and monitor. In this type of application, image recordings may be sampled at a rate of one image per minute, with the image recordings capturing real time information in the form of RT data elements. Sound may be recorded in a continuous fashion and also capture real time information in the form of RT data elements. To reproduce image and sound for examination purposes, the RT data element of the audio recording serves as the synchronization signal. Supposing an operator chooses an RT data element interval of 1999-07-

10 18:30:24 to 1999-07-10 18:50:00, then, for the selected time period, the video component displays a sequence of 20 images taken from the selected time interval and the associated sound recording is played.

[0026] Another method of recording and reproducing sampled audio and video recordings uses a digital recording system with a single CCD or CMOS camera featuring a motion detection function and a microphone. This method is particularly appropriate in security and surveillance systems. Sound is recorded in a continuous fashion, as it does not require excessive recording medium capacity. Image is sampled every tenth second or continuously on detecting motion. In this instance, the real time of the audio recording serves as the synchronization element during playback. In other words, while replaying a time interval, the operator listens to sounds in the surveyed area (such as a conversation between two and more people who remain static). On making a motion, the persons automatically activate the motion detection function and the system continuously records the image, enabling the operator to view an image (moving persons) while continuing to monitor sounds. After the persons become static, the system reverts to sampling at a rate of one image every ten seconds, while the sound continues to be recorded, uninterrupted.

[0027] The motion detection function, however, can be configured to allow a system operator to switch on continuous recording where sound is recorded in a continuous fashion. For example, if a security officer responsible for a secured area views on screen and listens to what goes on in the secured area, the officer has the option of activating continuous image recording to capture, in detail, the action in a given time interval. During playback, sound is reproduced continuously and image is sampled. Starting at the moment when the officer activated

continuous image recording, image is also displayed continuously after which it is sampled again. Sound invariably remains continuous. The advantage is that images, be it sampled or continuously recorded, are synchronized with sound during playback, as the images are displayed at the moments when the recorded real time image matches the recorded real time of the sound.

[0028] An alternative way for recording and playing back several digital locally dependent continuous audio and video recordings is also contemplated. Such application is particularly well suited for the filmmaking industry and for the creation of film effects. For example, a unique non-recurring scene can be filmed by a plurality of cameras from a plurality of angles, which record the images and sounds in real time using RT data elements. During editing, which occurs at a later moment in time, the RT data elements of the audio and/or video recordings can be utilized to synchronize the images associated with particular sounds taken from a particular camera, or sounds comprising similar RT data elements, taken from other sound recording devices.

[0029] Another application of the present invention comprises recording and projecting analogous continuous audio and video recordings in conventional filmmaking technology, where image and sound are optically recorded on conventional film tape. In this application, the method in accordance with the present invention can be provided by means of a bar code, or other means, wherein real time information and RT data elements are placed onto the film tape between images, or onto the marginal segments of the recording medium. Such application would enable the synchronization of images and sounds.

[0030] Finally, a particularly practical application of the subject invention comprises utilizing the method of the present invention for audio and/or video monitoring a plurality of

locales. For example, suppose a manager of a company desires to monitor six (6) rooms in an office building as shown in Figure 5; the present invention may be utilized to record in sampling mode in order to save recording medium. However, upon detecting movement or motion, an appropriate camera can be instructed to record at five (5), or more, frames per second. Video signals from four (4) of the six (6) cameras of Figure 5 may be recorded onto one PC and signals from the two remaining cameras may be recorded onto another PC. The audio signals may also be recorded on a plurality of PC's. The recorded signals may, thus, be reproduced on one PC and simultaneously projected onto one monitor, or upon separate monitors. Hence, one viewing the monitor, or monitors, may simultaneously view all of the images in real time. Heretofore, simultaneous reproduction of autonomous real time recordings was not provided. It should be appreciated, however, that each individual recording may also be reproduced individually from one another.

[0031] Thus, as is apparent, a method of recording, reproducing or projecting digital or analog sampled or continuous audio and/or video recordings in accordance with the present invention is provided for general application in a plurality of audio and video recording and reproduction systems and/or projection technologies.

What I Claim Is:

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ABSTRACT

A method for synchronizing a plurality of audio and video recordings generally comprises integrating a real time data element into audio and video recordings during recording procedures, analyzing the real time data elements of the audio and video recordings during reproduction, comparing the real time data elements of the audio and video recordings with one another, and synchronously projecting the audio and video recordings as a function of the information contained in the real time data elements. Real time data elements of the present invention generally include an extension data portion, for providing optional data, and a real time data component, which contains information pertaining to the location and the actual time of recording. Consequently, the synchronization of audio and video recordings is provided even where the recordings are produced independently of one another or upon different types of recording medium.